

GAS TURBINE RESEARCH

Tribology

The Gas Turbine Laboratory (GTL) of the NRC Institute for Aerospace Research (NRC Aerospace) offers proven theoretical and experimental expertise as well as full-scale instrumented test facilities. The mission of its tribology program is to help clients and partners extend the life, and optimize the performance, of their mechanical equipment and rotating machinery – at higher operating speeds, under heavier loads, and in harsher operating environments.

NRC Aerospace provides independent research, development and consultancy services to clients and partners from both government and industry. In doing so, it aims to provide the best available services for tribological testing, analysis and modeling. We offer practicable solutions to problems dealing with the lubrication, friction and wear (tribology) of mechanical equipment and rotating machinery.



The GTL management system has been registered to ISO 9001:2000

Project areas

Projects vary from one-day consultancies to research and development projects spanning one year or more. NRC Aerospace partners and clients include both manufacturers and end-users of rotating machines and machine components, such as bearings, gears, filters and lubricants.

Tribology activities include:

- investigation of static and dynamic performance of journal bearings using unique test facilities and a state-of-the-art computer model for plain and tilting pad bearings
- performance evaluation of high-speed rolling element bearings
- diagnostic and predictive health management (DPHM) for rolling element bearings



Preparing the abradable test rig for testing

- experimental investigations of static and dynamic performance of gas foil journal bearings
- evaluation of materials for honeycomb seals and abradable seals
- performance evaluation of oils as lubricants for bearings in high-speed rotating machinery
- evaluation of new load-bearing materials.

Proven capabilities

The expertise of our tribology staff has been proven in numerous projects for industrial partners, such as:

- measurements of dynamic properties of tilting-pad journal bearings
- performance of direct lubricated tilting-pad bearings
- evaluation of composite materials for traction motor bearings
- comparative study of synthetic and mineral-based oils lubricating large journal bearings
- contamination control in lubrication of journal bearings

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Journal bearing static test facility

- CFD analysis of oil flow in lubrication systems of large hydraulic turbines
- comparative study of abrasible seal materials for gas turbine engines.

Facilities

NRC Aerospace offers full-scale instrumented test facilities with dedicated data acquisition systems, including:

- a 150 mm Journal Bearing Static Test Facility



Journal bearing dynamic test facility

- a 100 mm Journal Bearing Dynamic Test Facility
- a 200 mm Journal Bearing Static Test Facility
- an Abradable and Honeycomb Seals Facility, and
- a High Speed Roller Bearing Test Facility.

Standard tribological testers, such as Falex Block-on-Ring, are also offered.

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January 2006
Aussi offert en français
IAR-GT05e